In conjunction with
THE FIRE SERVICE COLLEGE
MORETON-IN-MARSH ENGLAND

ROPE RESCUE ONE - OPERATOR

Outline of Course Syllabus
Outreach Rescue

Version: June 2010

Version Control Information

Version	Summary of Change	Lead Author/Reviewer
Feb 2009	Original document	
June 2010	Logo change and reformatting, validated against Rope Operator manual L4 09	A Read

BASIC EQUIPMENT

Harnesses and Helmets • Donning and dofing • Understanding of applications, and limitations including working life • Ability to correctly appraise wear points • Awareness of types and applications	**Cowstail rigs (Short dynamic line/lanyards)** • Attaching to harness • Understand use • Understanding limitations • Ability to appraise wear, and monitor integrity Maintenance
Slings • Understand use and application • Understanding of strengths and limitations • Ability to appraise wear points (see also anchors)	**Karabiners** • Use • Understand correct use • Understand limitations • Inspection & maintenance
Maillions • Use • Understanding application • Inspection & maintenance	**Rigging plates** • Application • Anchor and rescue systems • Understand advantages and limitations
Wire slings • Application and fixing to harness • Understand use and limitations • Inspection	**Pulleys** • Application • Inspection & maintenance
Rescue strop • Application • Understanding of uses and limitations • Inspection	**Scaffold hooks** • Inspection • Open/Close • Fit to harness when out of use • Combine with ascenders • Maintenance (See climbing)

Rope Work and Edge Management

Rope Work

Rope types
Understanding construction and properties

Rope Dynamics – Understanding of Fall Factors:
- Shock absorption
- Sheath slippage
- Safe angles under tension

Rope care and Coiling
- Coiling (Butterfly)
- Storing in a rope bag / storage
- Working life
- Damage avoidance
- Inspection, identification and appraisal of damages

Edge management

Rope protection and efficiency
- Application of edge sleeves
- Understand implications of moving and non-moving ropes in contact with edge
- Understand risks from abrasion and melting

Top Station Management
- Provision of safe system of work for those near edges
- Understand the importance of each of the following: Communication, Housekeeping, Cordons, Team work, Safety issues and Dynamic Risk Assessment

Basics of Knots and their Application/Limitations

Figure 8 Rethreaded Fig 8	Bowline Alpine Butterfly

Double Fig 8 French Prussik Klemheist Big Fat Knot Isolating rope damage (Alpine butterfly and overhand knot)	Clove Hitch Italian Hitch Double Fisherman Figure Nine Rethreaded Overhand Tensionless hitch

Anchors and Belays

Anchor Systems

Single point anchor selection

- Anchor selection, taking into account the forces and directions of loading
- Ability to appraise potential wear points
- Assessment of anchors in the built and natural environment
- Ability to appraise working space requirements

Multiple anchor, anchor selection

- Assessment of multiple anchors taking into account forces and directions of loads
- Ability to appraise working space requirements
- Equalising loads

Ground anchor systems

- Understanding of ground anchor system
- Limitations of ground anchor systems

Main Belays

Single point anchors (Slings and Karabiners)

- Application individually and in combination
- Understand limitations

Single point anchors (Rope – Fat Knot)

- Ensuring appropriate strength
- Mitigating against rope damage
- Producing suitable attachment points
- Set up in built and natural environments
- Understand use

Multi point anchors (Slings and Karabiners)

- Load equalisation
- Shortening slings
- Assessing/avoiding and abrasion
- Understanding of uses and limitations

Deviations

- Ensuring sufficient strength
- Ensuring maximum efficiency
- Understand use and limitation

Belay Systems and Rope Locks

Self Locking Belay Device

Threading
Attaching to belay
Use as safety back-up
Lowering under load
Holding shock load
Locking off
Releasing under load
Line management
Understanding of use and limitations

Rope locks

Shunts
Rockers
Rescue Ascenders
Attaching to rope
Positioning
Moving position on rope
Use in conjunction with abseil device
Understanding of:

- Use and limitations
- Correct positioning in different orientations

Working at Height – Legislation and Systems of Work

Working at Height

Work at Height Regulations

- application for operations and training
- hierarchy of protection

Work positioning

- establishing hands free work stations at height

Work Restraints

- For working near an edge
- Associated hazards (e.g. building corners)

Fall Arrest

Inspection of Equipment

Understanding of:

- Inspection requirements
- Actions on finding potential damage

Practical inspection of:

- Personal equipment
- Software (e.g. slings/ropes)
- Hardware (e.g. karabiners, maillions)

• Moving at height • Self lining Collective Protection • Safety rails, use of sentries Fragile Surfaces Exclusion zones Understanding of: • Fall factors	
Rope Systems	
Ascending/Descending Ropes Use of ascending devices in twin line working (rope control device, ascender and rope grab) • Ascending ropes • With a rope grab safety backup Understanding of: • Advantages, limitations and risks Self lining (Ascent of a structure whilst rope passes through rope lock to sternal attachment) • Self lining Understanding of: • Uses and limitations	**Lowering systems** Basic lowering of 1 or 2 persons • 2 rope system • Locking off • Releasing under load Understanding advantages and limitations of: • Lowering systems, Strop rescues and Edge management issues
Top Rope Systems Rope systems to support and safeguard rescuer Belaying – (see Belay systems) Understanding of: • Associated risks • Risks of dislodging material with ropes	**Twin Line Systems** Understanding of: • Principle of 100% redundancy (twin line working) • Advantages/ Disadvantages • Operational considerations • Adjustments on rigging • Risk reduction / safe systems of work
Abseiling Abseiling with auto locking device • Abseiling • With safety Rope from above • With safety from a second rope Understanding of: • Advantages and disadvantages • Edge management systems	
Basic Tensioning and Hauling systems	
V Rigs • V Rig systems • Integration of Pulleys • Integration of Belay device Understanding of the: • Mechanical advantage • Limitations • Advantages over other systems • Edge management issues • Use as an enhancement of existing systems • Application/limitations to cableways	3:1 systems • 3:1 systems • Integrating Belay devices Understanding of • Mechanical advantage • Limitations • Edge management issues Other Pulley systems - 5:1, 6:1, 9:1 • Construction • Application Understanding of:

	• Frictional issues and limitations
Stretcher Attachments	
Horizontal position Understanding of: • Uses, limitations and attendant attachments	**Vertical position** Understanding of: • Uses, limitations and attendant Attachments
Rope Rescue Theory & Systems Analysis	
Understanding of: • SI Units used • SWL/WLL/MBS (definitions and application to system components) • Static System Safety Factor	• Whistle or hold up test • Whiteboard analysis • Critical point examination • Failure modes